

IN THE CLAIMS

Please enter the indicated Amendments and Allow the resulting Claims.

1. (presently amended): A method of investigating a sample having:

front and back sides and which comprises at least one thin film (TF) on the front surface side of a substrate (SUB),

with a beam of electromagnetic radiation (EMI) which impinges thereupon upon a surface (SUR) of said thin film at an oblique angle of incidence (θ), said method eliminating the effects of reflection from the back side (BS) of said substrate (SUB) in a beam of electromagnetic radiation (EMR) which reflects from the surface (SUR) of the at least one thin film (TF), said method comprising:

providing a substrate (SUB) with at least one thin film (TF) on the front surface side thereof, said at least one thin film (TF) presenting [[a]] with said surface (SUR), and

placing a mask (M) upon in direct contact with the said surface (SUR) of the at least one thin film (TF), said mask having a hole (H) therein with an effective radius (D) which is related to the thickness (T) of the sample by the equation:

$$D \leq 2T \tan (\theta');$$

where (T) is the combined thickness of said at least one thin film (TF) and the substrate (SUB) and (θ') is an oblique angle of

incidence at which said beam of electromagnetic radiation (EMI) impinges upon said back side of said sample;

causing an incident beam of electromagnetic radiation (EMI) of cross sectional diameter (BW) to impinge upon the sample thin film surface (SUR) at an oblique angle of incidence (θ);

such that said incident electromagnetic beam (EMI) reflects from the surface (SUR) of said at least one thin film (TF) as reflected electromagnetic beam (EMR), said reflected electromagnetic beam (EMR) having no component therein which reflected from the back side (BS) of said substrate (SUB) as a result of the blocking thereof by said mask (M); and

causing said reflected beam of electromagnetic radiation (EMR) to be analyzed.

2. (presently amended): A method of investigating a sample which comprises a substrate (SUB) having:

front and back sides,

with a beam of electromagnetic radiation (EMI) which impinges ~~thereupon~~ upon said front side thereof at an oblique angle of incidence (θ), said method eliminating the effects of reflection from the back side (BS) of said substrate (SUB) in a beam of electromagnetic radiation (EMR) which reflects from the ~~surface~~ front side (SUR) of said substrate (SUB), said method comprising:

providing a substrate (SUB) presenting with a front side surface (SUR); and

placing a mask (M) upon in direct contact with the said front side surface (SUR) of said substrate (SUB), said mask (M) having a hole (H) therein with an effective radius (D) which is related to the thickness (T) of the substrate by the equation:

$$D \leq 2T \tan (\theta');$$

where (T) is the thickness of said substrate (SUB) and (θ') is an oblique angle of incidence at which said beam of electromagnetic radiation (EMI) impinges upon said back side (BS) of said substrate (SUB);

causing an incident beam of electromagnetic radiation (EMI) of cross sectional diameter (BW) to impinge upon the substrate surface (SUR) at an oblique angle of incidence (θ),

such that said incident electromagnetic beam (EMI) reflects from the front side surface (SUR) of said substrate (SUB) as reflected electromagnetic beam (EMR), said reflected electromagnetic beam (EMR) having no component therein which reflected from the back side (BS) of said substrate (SUB) as a result of the blocking thereof by said mask (M); and

causing said reflected beam of electromagnetic radiation (EMR) to be analyzed.

DISCUSSION

The Examiner has cited Patent No. 3,857,637 to Obenredder under Section 103. Applicant notes that the opaque element (35) therein is shown in Fig. 3 thereof to be offset from contact with the top surface (29) of the sample glass (21). Further, in Col. 6, Lines 45 - 51 of the 637 Patent it is stated that:

... an opaque member (35) such as a metal washer may be positioned adjacent the top surface (see Figs. 2 and 3). In the instance where the washer is used, it would be advantageously positioned in the return tube (107) to shield the detector surface from the beam reflected from the bottom surface of the glass.

In analyzing said language it is first noted that Fig. 2 in the 637 Patent does not show element (35) and it is not understood why it was referenced in said language. Again, Fig. 3 does show element (35) as being

adjacent to

the top surface of the sample glass (21). Webster's New Collegiate Dictionary provides insight that the word "adjacent" does not necessarily imply contact between adjacent element, and since no Figure in the 637 Patent shows direct contact between opaque element (35) and sample glass (21) Applicant concludes contact is not disclosed between elements (21) and (35) in the 637 Patent. The above quoted language from the 637 Patent further suggests placing the opaque element (35) in return tube (107), (see Fig. 5 in the 637 Patent). This would seem to dictate interpreting the 637 Patent as not indicating contact

between opaque element (35) and sample glass (21) for if opaque element (35) is placed in tube (107) then some extend of tube (107) would be closer to the sample glass (107) than would be the opaque element (35). Further, as Fig. 5 is understood by Applicant from the language in Col. 5, following Line 39, the sample glass (21) is intended to be moved during practice of the 637 Patent invention. See Lines 46-47 in Col. 5 where it states:

"The apparatus 63 has a conveyor 65 for displacing the glass 21 relative to the light emitting and receiving station..."

Applicant argues that were the opaque element (35) placed in contact with the sample glass 21 as it moves, the 637 invention utility would be lost as said opaque element (35) would change the very thing it is intended to measure, by causing scratching-like effects to the sample glass (21). (Note, the opaque element would have to remain in a constant relationship to tube (107) for it to consistantly block back side reflection from the sample glass (21) as said sample glass (21) is moved, so there would definitely be relative motion between opaque element (35) and the sample glass (21) during practice of the method of the 637 Patent.

Other than the use of an ambiguous word (ie. adjacent), in the 637 Patent, nothing therein remotely suggests that element (35) and the sample glass (21) might be placed into direct contact with one another. And since the word "adjacent" does not require contact, in view of Fig. 3 showing non-contact between opaque element (35) and sample glass (21), and in view of the quoted language from Col 6 Lines 45-51 which suggests placing the opaque element in tube (107) which would indicate non-contact between opaque element (35) and sample glass (21), and in view of the fact that were actual direct contact effected between opaque

element (35) and sample glass (21) the operation system of Fig. 7 would be defeated as relative motion between contacting opaque element (35) and sample glass (21) would alter the sample glass (21) via scratching-like actions and thereby defeat its utility, Applicant argues that the 637 Patent does not obviate or even remotely suggest placing a Mask in contact with a sample as is done in the present invention.

Further, the equation:

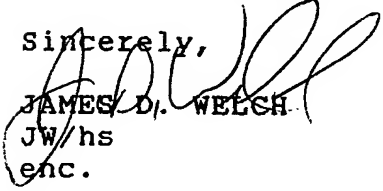
$$D \leq 2T \tan (\theta');$$

which is included in the Claims to the present invention is valid only when the present invention Mask (M) and Surface (SUR) are in direct contact. Said equation would not apply in the 637 Patent setting in which the opaque element (35) is not in contact with the sample glass (21). Were such an equation provided in the 637 Patent, (which the Examiner agrees it is not), it would have to define Thickness (T) differently than is the case in the present invention. An additional offset distance would have to be entered to the equation in the 637 Patent system setting. It is argued that inclusion of the Equation $D \leq 2T \tan (\theta')$ in the Present Claims provides a definite differentiating limitation over the 637 Patent.

For the many reasons identified above the Applicant argues that the 637 Patent does not remotely suggest placing a Mask (M) into direct contact with a Sample Front Surface (SUR) for the purpose of blocking reflected electromagnetic radiation from a back side (BS) thereof.

It is now believed that the Claism 1 and 2 are Allowable, therefore the Examiner is respectfully requested to provide Notice of Allowance and Issue Fee due. Should problems remain, please contact Attorney Welch who is receptive to Examiner suggestion and Amendment.

Sincerely,


JAMES D. WELCH

JW/hs

enc.